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AUTHOR Howley, Craig; Harmon, Hobart
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ABSTRACT

This report presents selected results of a national study of school districts operating at least one K-12 unit school. Of the 706 districts operating unit schools, 157 districts in 27 states responded to the survey. The majority of respondents (106) were superintendents of one-school districts, that is, districts in which the K-12 unit school was the only school. Of the 53 multischool districts, about half operated just one K-12 unit school. Data reveal that K-12 unit schools were usually located in an agricultural region where socioeconomic status was lower than the national average; the average unit school enrollment was 414; most unit schools in multischool districts were comparatively remote from key resources such as hospitals, interstate highways, and cities; superintendents of single-school districts reported higher rates of above-average test scores, postsecondary attendance, and high school completion than did superintendents of multischool districts; satellite and Internet systems were the most prevalent forms of distance learning technologies in use; community attitudes toward single-school districts were moderately and positively related to the sustainability of the school; single-school districts spent almost 50 percent more per pupil than multischool districts; and single-school districts more often than multischool districts employed cooperative strategies for maximizing resources such as joining regional service agencies or cooperating with other districts. Includes data tables and recommendations for research and practice. Contains 24 references. (LP)

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K-12 Unit Schooling in Rural America: A First Description

Craig Howley
Hobart Harmon

The Rural Center at AEL
and the ERIC Clearinghouse on Rural Education and Small Schools

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National Rural Education Association
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Appalachia Educational Laboratory
P.O. Box 1348
Charleston, WV 25325
howleyc@ael.org
harmonh@ael.org
<http://www.ael.org>
800/624-9120

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K-12 Unit Schooling in Rural America: A First Description

Are K-12 unit schools ¹ an anachronism or are they a sign of things to come? Lost forms of schooling represent lost opportunities for experimentation, innovation, and generating flexible responses to new challenges in public education. Vanishing forms of schooling include the once-predominant K-8 configuration and the K-12 unit school.

Schools are variously configured by grade levels with much greater variability than most educators or citizens realize. Still, configurations do cluster around strongly advocated ideals: K-4 primary schools, 5-8 middle schools, and 9-12 high schools. In earlier eras the favored configurations were different (e.g., K-8 and 9-12; or K-6, 7-9, and 10-12), and in many places these earlier forms persist, often along with newer fashions or models of schooling. In rural places, in particular, the heresies have been commonplace, and persist to this day (K-6 and 7-12; K-4 and 5-12; or--the focus of this study--all K-12 under one roof).

Perhaps it is time to introduce the rural experience of K-12 unit schools into the important rhetoric of educational reform for a new century. K-12 unit schools are perhaps one source of insight into the requirements for building smaller, more flexible organizational models for public education. This paper presents selected results of a national study, conducted by researchers in The Rural Center at AEL, of districts reported to operate at least one K-12 "unit" school.

Why Study K-12 Unit Schools?

¹In the west, such schools are known as "unit schools." "K-12 unit schools" contains a redundancy, therefore, but one that seems advisable on account of the obscurity of this organizational form.

K-12 unit schools interest for four related reasons. First, they represent an uncommon school configuration *per se*; these schools are not only unusual, but *not recommended*; they are a compromise with necessity. For this reason, they may have escaped some of the handicaps of usual practice.

Second, and on the other hand, some K-12 unit schools may nonetheless, and doubtless to some extent nearly everywhere, carry out the national purposes of sorting students within an "inappropriate" configuration. American educational policy since 1945 has been characterized as having aimed at creating "sorting machine" (Spring, 1976). At present, neither the profession nor the public is satisfied that sorting students into tracks, rigid curricula, or probable destinies is a purpose worthy of democratic intentions (e.g., Anyon, 1980; Apple, 1993; Gamoran, 1992; Kozol, 1991; Oakes, 1985).

When most of us think of the functioning of the sorting machine, we think of *students*. One obvious sorting device has been almost entirely overlooked however: grade-span-configuration. Is such a form as the K-12 unit school--or practices associated with it--more or less apt to sort students than the more familiar age-graded configurations (e.g., primary, middle, junior highs, senior highs, alternative schools)?

Third, we are interested in K-12 unit schools because they may represent the final stage of 20th century school consolidation, peculiar but not unique to rural areas.² Consolidation frequently pits local interests against state or national interests, and in most cases local

²Large K-12 campuses, often with connecting buildings, are being constructed to serve entire districts in some urbanized or suburbanized areas. Such places are not our primary object of study, principally because they cannot properly be called "schools," and in fact, are usually referred to as "campuses."

communities have been the losers (e.g., DeYoung & Howley, 1992). Therefore, the status of community involvement in K-12 unit schools is problematic. There is an untold history in the persistence of these schools, and the present study may provide clues to help others tell this history.

Finally, and with the most hope, these schools interest us as a possible harbinger of things to come, an example of educational institutions devoted to personalizing the educational experiences of students and building a collegial learning community of educators--while maintaining and strengthening the integrity of small, rural schools with their communities--rather than sorting students, educators, and communities in the name of educational efficiency and advanced opportunity for meeting the needs of a global economy. On this perhaps slender hope rests the practicality of our interests.

Several features of K-12 schools lead us to hope: they are generally small; they have perhaps better opportunities (whether realized or not) to be closer to, and reflect the values of, their communities than most schools; they may more easily integrate children and youth across all ages (the "multi-age" virtue). Some of these schools may distance themselves from the bureaucratic climate associated with external regulation. Perhaps, for all these reasons, some of these schools may be more democratic than is typical in American schools (cf. Brown, 1991; Meier, 1995; but cf. Schmuck & Schmuck, 1992).

Thus, we suspect that a complex knot of issues surrounds the establishment, maintenance, and sustainability of K-12 unit schools. This paper attempts only a first step at unpacking the complex issues, principally by organizing a discussion of the descriptive information gathered in the national survey we have recently completed and offering a few exploratory analyses. Later

efforts, we hope, will draw more complex inferences from these data.

Extant Literature

About 1,000 K-12 unit schools continue to exist in the U.S.; however, very little is known about them. The literature base on K-12 unit schools, in fact, is even thinner than the literature base on one-teacher schools. This lack of attention is an indicator that reformers are overlooking the possible relevance of K-12 unit schools to their efforts.

K-12 unit schools receive far less popular attention than the few hundred remaining one-teacher schools, and yet K-12 unit schools are almost as rare as one-teacher schools. They tend to serve remote rural communities; they are targets for consolidation and closure; and they pose dilemmas for superintendents of the districts in which they are located--especially for superintendents of larger districts in which the K-12 unit school may exist as an unusual organizational form. Existing literature tends to confound K-12 unit schools and small districts; most relevant studies actually examine small districts. We begin with the most directly relevant study that we were able to locate.

A Louisiana study (Franklin & Glascock, 1996) suggests that among common organizational forms, K-12 unit schools may be unusually effective in comparison to other grade configurations. These researchers compared a variety of outcome measures (test scores, and various measures of persistence) in elementary, middle, secondary, and K-12 unit schools. K-12 unit schools and elementary schools outperformed middle and secondary schools on achievement and persistence.

Barker and Muse (1983) conducted a study of small school districts over a dozen years

ago that doubtless included many single-school districts (districts that operate a single K-12 unit school). Barker and Muse compared K-12 rural school districts with fewer than 300 students to those with enrollments of 301-900, using information from districts in 45 states. Superintendents in both groups reported that their greatest challenge was to ensure fiscal adequacy, followed by the need to improve curriculum. Superintendents in the smaller districts reported that securing teachers was their third-ranked problem; those from the larger districts ranked providing meaningful inservice instruction third. Both groups of superintendents reported difficulty in locating qualified math and science teachers as their most significant staff recruitment problem. Both cited lack of motivation, goals, or direction as more serious student problems than drugs, vandalism, sex, alcoholism, or cheating.

A survey of Class "C" schools (including K-12 unit schools) in Montana is conducted periodically for comparing budgets, levies, enrollments, and various other data among the school districts (Western Montana College, 1995). This is the only *periodic* data collection effort relevant to K-12 schools reported in the literature.

Ferre (1991) asked 30 rural superintendents to identify the most critical issues in managing and running small rural school districts. Results indicated finances were the greatest worry, followed by regional economic conditions, state regulations, salaries, and providing an adequate variety of classes. More recently, Barker and Hall (1994) conducted a national survey of 130 single-campus, K-12 public schools enrolling fewer than 300 students to investigate distance education technologies and practices in rural schools. They found that one-half of the schools received classroom-focused learning programs. Satellite-based delivery was the most commonly used technology, followed by cable television. Secondary students were clearly the

target audience, with less than 10 percent of distance learning programs intended for elementary students. Principals reported that the greatest programming needs were in foreign language, mathematics, science, and vocational education.

In 1980, the National Institute of Education created a statistical profile of small rural schools in the United States (Dunne & Carlsen, 1981). Survey responses from teachers, administrators and school board members revealed that communities believed their schools were meeting their objectives for training in basic academic skills; preparation for work, parenthood, and citizenship; and service as a community institution. A more recent, comprehensive and highly regarded report on the condition of education in rural schools (Stern, 1994), published by the U. S. Department of Education, makes no mention of K-12 unit schools.

Swift (1982) identified major problems and measures to alleviate the problems of 19 "very small" (fewer than 300 average daily membership K-12) school districts in New Mexico. Although such districts were largely ignored in the literature, they comprised 21 percent of the schools districts in New Mexico. The four primary concerns of the districts were (1) certification, multiple endorsements, and staff development; (2) adequate instructional programs and student services; (3) salary comparability; and (4) housing and community resources.

Most of the school grade-level configuration literature focuses on middle schools (Alsbaugh & Harting, 1995; DeYoung & Howley, 1995; Educational Research Service; 1983; Hough, 1991; Pugh, 1988; Vann, 1992; Wihry, Coladarci, & Meadow, 1992). Pugh concluded that a public school's decision to convert to middle schools would not be valid based solely on the literature. Moreover, Johnson (1982), in reviewing trends in grade configuration and factors to consider in examining changes at the district level, cited the lack of empirical evidence

supporting any one form of grade organization as a reason for the range of patterns found in American schools districts.

Whereas one-teacher schools appeal to the imagination as a quaint anachronism, K-12 unit schools are probably more relevant than one-teacher schools to national reform efforts. Urban and suburban districts have begun to explore the benefits of small schools and schools with wider, rather than narrower, grade-span configurations.

Methods

The frame for the population of K-12 unit schools was provided by information in The National Center for Education Statistics' (NCES) *Common Core of Data* (CCD). Data in the CCD indicate that in the 1992-1993 school year, the most recent year for which national data existed when the study was conceived, there were 1,051 such schools located in 706 districts.

Data were gathered via a survey instrument developed by the researchers. A group of 10 superintendents who administered K-12 unit schools in rural districts in 8 states participated in a telephone conference call to consider issues and provide insight for designing the survey instrument. Based on the information provided by the superintendents, the AEL researchers drafted the instrument; elicited feedback from two persons in AEL's Planning, Research and Evaluation unit; pilot tested the instrument with the 10 collaborating superintendents; and prepared and administered the final survey protocol. Data were collected in May and June of 1996.

Target respondents were the superintendents of the 706 districts with at least one K-12 school. Schools were identified as those schools with twelfth grade as their highest grade and

pre-Kindergarten, Kindergarten, or first grade as their lowest grade. The CCD school records contain a local education agency identification number, and this number served to identify the 706 related districts.

One followup effort resulted in valid responses from 159 respondents (22.5%). An additional 17 respondents indicated that there were no K-12 unit schools in their districts (24.9% overall response rate).

Sample sizes for the various analyses reported here vary due to missing data. As part of our initial effort to describe these schools, we also developed several composite measures, three of them scale variables. Reliability coefficients for data sets from the survey instrument described in this paper are as follows: community attitudes, $\alpha=.88$; remoteness, $\alpha=.88$; sustainability (for multi-school districts)=.87.

Findings

Though we collected extensive information on educational opportunities, curriculum, extracurricular activities, staffing, special education, and fiscal practices, space does not permit a full reporting of these issues. Instead, we have concentrated in this first effort at describing these schools and districts on issues of context and outcomes that bear on persistence and sustainability. We focus in this paper particularly on demographics, student performance, use of distance learning technology, community attitudes, and political dilemmas (finance and sustainability). Some of the results reported below pertain to districts and some to schools (as noted when required).

Demographics. Responses ($n=159$) represented information from 27 states and all

regions of the nation (see Table 1). Of these, 54 percent ($n=86$) came from five states (New York, Texas, Washington, and Tennessee). Hawaii reportedly operates 5 K-12 unit schools, but constitutes a single district. For descriptions of districts, therefore, Hawaii is excluded in many analyses, since it is a district like no other (i.e., where the SEA is the LEA). Table 1 reports frequencies for both schools and districts, by state.

Two-thirds of respondents ($n=106$) were superintendents of *one-school districts*, that is, districts in which the K-12 unit school was the only school in the district. Of the 53 multi-school districts, however, about half ($n=24$) reportedly operate just one K-12 unit school. Possibly, the experience of these two groups (schools in single- and multi-school districts) might differ with respect district-level commitments to sustainability and contrasting levels or degrees of community involvement. These hypotheses are explored to some degree in this article (see "community attitudes" and "political dilemmas," below).

District enrollments varied from 64 students to 27,000 (excluding Hawaii); median district enrollment was 403 (again, excluding Hawaii); with a positively skewed data set, the mean district enrollment was 1,760. K-12 unit *school enrollments* varied between 9 and 1,700, with an average size of 414 (median enrollment was 340; $n=203$ schools for which enrollment data was reported). Respondents reported that, in the *counties* where they were located, a median of 4 districts existed (including their own); the value for this variable ranged upward to more than 70 (for an island district located near New York City).

Respondents classified the economic bases of their districts according to a scheme using the same categories as those used by the Economic Research Service of the U.S. Department of Agriculture (but, of course, based on respondent perceptions and not actual data). According to

respondents' classifications, *59% of the districts had an agricultural base*, 19 percent had mixed economies (choices included: agriculture, mining, manufacturing, recreation and tourism, government service, other), and 9.5% reportedly had economies based on recreation and tourism. Just 3.8% were reported as having an economic base in manufacturing, 2.5% in government services, and *no districts were identified as having an economic basis in mining*. It seems clear that agriculture is a main feature of the local economies of these schools, whereas mining would be a very uncommon circumstance.

Respondents were asked to provide estimates of district and school socioeconomic status (SES). National 1990 average household income, per-capita income, and poverty rates were provided as referents for respondents. For the entire sample, (as might be expected in view of the preponderance of single-school districts), results were similar for districts and schools. Approximately 2/3 were rated as having SES below the national averages; approximately 1/4 were rated as having average SES. About 10% of districts and about 5% of schools were identified as having above-average SES.

We also asked questions about the district's remoteness from essential resources-- hospital, a variety of postsecondary institutions, educational service units (if any), state capital, interstate highway exit, and central city of 50,000 or more residents (see Table 2). In the case of multi-school districts, we also asked about the remoteness of K-12 unit schools from district offices.

Student performance. We asked respondents to assess three varieties of student performance for each K-12 unit school in their districts: standardized test scores, rate of postsecondary attendance, and high school completion rate. Each item used a 5-point scale

ranging from poor to excellent. We report frequencies here for the sample as a whole and for two subgroups: single-school districts and multi-school districts (see Table 3).

Data on a maximum number of 205 schools are available for analysis. Actual samples vary somewhat due to missing data. Overall respondents reported that approximately half of these K-12 schools had above average completion rates, test scores, and postsecondary attendance. Approximately 20%, 16% and 5% reportedly had, respectively below average postsecondary attendance, test scores, and completion rates.

The overall picture, however, masks apparent variations associated with district organization. Data for a maximum of 106 single-district K-12 unit schools and 99 K-12 unit schools in multi-school districts are represented in the data set. Student performance is of particular interest to the superintendents whose counsel guided the development of our survey instrument because of its importance in state accountability systems; it is of particular interest to us as a salient indicator of school effectiveness. Though our variables are self-report measures, they do enable rough comparisons such as that reported in Table 3.

In Table 3, there is a distinct tendency of respondents in single-school districts to report above higher performance more frequently than respondents in multi-school districts, and to report average and below average performance less frequently than respondents in multi-school districts. In single-school districts, for instance superintendents (who may also take the role of principal) rated 56.4% of those K-12 unit schools as having good or excellent standardized test scores, whereas superintendents of multi-school districts rated 36.5% of the K-12 unit schools as having good or excellent test scores.

Distance learning technologies. We asked respondents to assess the use of seven types of

"distance learning technology systems" in K-12 unit schools in their districts. Two types, microwave and fiber optic, were not analyzed as they seem to pertain more to components of a system rather than to a system.³ Five items (Internet, satellite, ITFS, audio conferencing, and audiographics) demonstrate the combination of infrastructure and applications that might justifiably be labeled a "system."

Data on schools (n=205) indicated the following usage among our sample of K-12 unit schools, as reported by respondent superintendents: satellite delivery systems, 64%; Internet, 58%; Instructional Television, Fixed Service (ITFS), 33%; audio conferencing, 15%; and audiographics, 5%.

We also counted the instances of usage of these five systems for each school and cross-tabulated the derived variable with the five separate usage variables (see Table 4). Minimum usage, therefore was associated with a count of 0 and maximum usage with a count of 5. We categorized usage as follows: non-users (0, 19% of cases), low users (1, 23% of cases), moderate users (2, 32% of cases); and high users (3 or higher, 26% of cases). Table 4 reports usage of the five systems according to these three categories. The evidence suggests a strong priority for use of satellite and Internet systems across *all levels* of technology usage in these K-12 unit schools.

Which combinations of these systems are these schools reportedly using?

Crosstabulations show that 40% of these schools reportedly use *both* satellite and Internet systems, whereas 21% use satellite, Internet, *and* ITFS systems. Crosstabulations also show that

³"Satellite" is shorthand among most educators for delivery of distance learning opportunities (e.g., TI-IN high school courses in science or languages) downlinked from satellite transponders. In this sense, it indicates a system rather than a component of infrastructure.

29% reportedly use two of these three systems (satellite, Internet, ITFS), whereas 26% reportedly use satellite *or* Internet *or* ITFS systems.

Perceived barriers are related to usage. We asked respondents to rate possible barriers in their *districts* (n=159) on a five-point scale ranging from "not an issue" (1) to "major issue" (5). Although the survey gathered information on 14 possible barriers, this article focuses on data about three sorts of cost, (1) "to purchase equipment and get started," (2) "to offer course(s) for students each semester," and (3) "to maintain and upgrade the telecommunications system."

The importance of startup costs as a barrier is highest among non-users and lowest among high users, as one might expect. Among non-users, 83% reported rated startup costs a 4 or 5 (substantial barrier). Still, among high-level users, 59% rated startup costs a substantial barrier.

Course costs, by contrast, were perceived as a substantial barrier (ratings of 4 or 5) by 50-60% of respondents regardless of usage level. The consistency of this result may be due to the prevalence of satellite technology in these schools (see Table 4). Satellite courses are purchased on a tuition basis in most cases.

The cost of maintenance and upgrading is perceived as greatest by non-users and low-level users (65% and 71%, respectively, gave ratings of 4 or 5). Among high-level users, however, 62% still regard the costs of maintaining and upgrading telecommunications systems as substantial (ratings of 4 or 5).

It is perhaps useful for readers to know that among the other 11 possible barriers (e.g., scheduling of distance learning courses, certification of personnel for distance learning, evaluation of distance learning) none was regarded at any level of usage as so serious a barrier as the three cost barriers.

Community attitudes. A series of 10 items constituted a scale ($\alpha=.88$) assessing the attitudes of the communities of up to three schools in respondents' districts. The items included ratings of community agreement with such statements as "students get a good education," "school is integral part of community," and "school reflects values of community." Respondents rated schools on a scale from 1 to 5. Thus the theoretical minimum and maximum scores were 10 and 50, respectively. Observed values ranged from 16 to 45, with a mean of 34.8 and a median of 35.0 ($sd=5.7$, $n=183$, with 22 missing cases). Considerable variation in respondents' assessment of particular school is therefore evident. Scores on this scale were moderately correlated with respondents' ratings of districts' ($r=.32$) and schools' ($r=.38$) socioeconomic status. One-way analyses of variance, however, found no significant difference in scores for single-school districts versus multi-school districts or for schools in districts with agricultural versus other economic bases.

Political dilemmas. It would seem likely that different dilemmas confront K-12 unit schools differently situated. Demographic data, as noted previously, suggest two seemingly very different situations: K-12 unit schools that themselves comprise a school district ($n=106$) and those in districts with more than one school ($n=99$). The latter group might well be divided between those in districts with other K-12 schools ($n=75$) and those that are the only K-12 school in a multi-school district ($n=24$).

Consolidation, however, is one dilemma that all such schools have confronted because the K-12 organizational model--like split-grade classrooms--has been considered a sort of necessary, and less than ideal, compromise. Indeed, conversation with the group of superintendents who advised us on substantive issues related to survey development, indicate

that K-12 unit schools are the result of previous attempts to create as large a school as possible. The dilemmas of consolidation, however, are doubtless simplified or complicated by circumstances of geography, history, politics, and economics.

We gathered a good deal of information relevant to these circumstances with the survey; indeed, understanding how these schools sustain themselves in view of their "compromised" existence is a main interest. Caution should be exercised, however, in interpreting the following information; a large proportion of the data are missing (a proportion larger for multi-school districts than for single-school districts). Briefly, single-school districts on average seem to spend about 50% more per pupil than is spent in K-12 unit schools in multi-school districts--so far as can be inferred from our data.

In multi-school districts, the average per-pupil expenditure for K-12 unit schools ($n=39$) is reportedly about \$4,239 (Median=\$4,000), with a range from \$3,200 to \$6,000 and a standard deviation of \$126. These figures differ markedly from those reported for single-district K-12 unit schools. The per-pupil expenditure for these schools ($n=86$) is a reported low of \$2,300 to a surprisingly high of \$35,000 (the latter figure confirmed with respondent). The mean is \$7,188 (median=\$6,000, standard deviation=\$423). In fact, 26% of these schools reportedly have per-pupil expenditures of *at least* \$8,500 and 15% have expenditures of at least \$10,000 per student. The single-school district schools, however, are reported to be substantially smaller (mean enrollment of 326) than their counterparts in multi-school districts (mean enrollment of 511).

In multi-school districts a frequent political dilemma regarding K-12 schools is the reality or perception that districts are spending more per pupil to sustain such schools. Data from the survey bear on this dilemma, but seem to rebut the common perception. Respondents from

multi-school districts reported per pupil expenditures for both K-12 unit schools and for the district as a whole. Mean district expenditures were \$4,009 versus \$4,239 for the K-12 schools. The typical K-12 unit school of about 350 or 400 students would hypothetically cost about \$70,000 to \$80,000 more to operate per year than other schools. It is important to observe, however, that this amount would be easily accounted for by differences in transportation costs associated with more remote locations.

Hypothetically, the more remote a school, the smaller it is likely to be and the greater its per pupil expenditures. We constructed a remoteness scale composed of 6 of the 10 remoteness items, which maximized alpha reliabilities ($\alpha=.88$). Our analysis classifies per pupil expenditures using a three-part classification by remoteness (see Table 5). Results (for schools for which valid data were reported) are suggestive of a curvilinear relationship of remoteness and per pupil expenditures. The highest expenditures are for schools of moderate remoteness, and the most remote schools are spending only about \$150 more per pupil than the least remote schools. Due to the pattern of missing cases, single-school districts compose 80% of the schools in the "more remote" category, however. Possibly, therefore, the very high expenditures for this category are an artifact of missing data.

Perhaps, however, some peculiarity of circumstance related to their existence as relatively autonomous units accounts for enhanced per pupil expenditures. In fact, 29% of respondents reported that K-12 unit schools in single-school districts generated more than half their operating revenues locally. By contrast, 44% of respondents in multi-school districts reported that having operating expenses approximately the same in their K-12 schools was a substantially important (ratings of 4 or 5 on a 5-point scale) for the persistence of the K-12 schools in those districts. An

interesting hypothesis would maintain that in multi-school districts K-12 unit schools experience restraints, whereas single-school districts seem to exercise their own sources of munificence. This hypothesis concerns, more broadly, the related issues of organizational scale and local autonomy.

Fiscal issues are of interest primarily because closures of small schools are almost always justified on the bases of resources to be saved as a result of closures. Although research hardly substantiates the expectation in the case of rural schools, small school advocates are understandably interested in fiscal issues because they bear on the sustainability of small rural schools. The survey asked a number of questions, specifically framed for either (1) single-school or (2) multi-school districts. Rough measures of sustainability were computed from these items. Pertinent items concerned such circumstances as importance of school to community, lack of opposition to school, failure of previous closure efforts, presence of special funding, and so forth (see Table 6 note for more details). Because the two sets questions were differently constructed for the two groups of schools and included somewhat different content, the measures cannot be considered strictly comparable. The findings are merely suggestive (see Table 6).

Table 6 presents correlations of these two sustainability measures with expenditure per pupil, the community attitude measure, and the remoteness measure. Sustainability--so far as one assumes that the two measures are reasonable proxies for one another--seems to be a different issue in the two groups of schools. For single-school districts, sustainability is seemingly not related to remoteness ($r = -.10$, n.s.) whereas it is strongly related to remoteness among multi-district schools ($r = -.78$, $p < .0005$). The more remote K-12 unit schools in multi-school districts are, the less highly did respondents rate the relevant items as a reason for the

continued existence of their K-12 unit schools: (1) availability of additional funding, (2) equivalence of expenditures to expenditures in other schools in the district, and (3) lack of opposition elsewhere in the district. The more remote the school, therefore, the less likely were these items to be considered a factor in the persistence of the schools. That is, one might infer that remoteness itself required the continuation of the schools.

Since fiscal exigencies differ between the two sorts of districts (multi- and single-school), it is reasonable to suspect that fiscal practices might also differ. Inman-Freitas (1992) surveyed superintendents and business managers of small rural districts to discover what sorts of practices they used to maximize resources. Our survey asked respondents to indicate use of 26 practices identified by Inman-Freitas. We developed a list of the top-ranked 10 strategies used, by school district type (see Table 7). Although it is clear that superintendents in both groups report use of the same strategies, two patterns of comparative usage are remarkable.

First, single-school districts reportedly use cooperative strategies to a significantly (statistically and practically) greater degree than multi-school districts. Cooperation appears to involve internal as well as external measures, as it includes more frequent use of secondary teachers as substitutes during free periods.

Second, multi-school districts may be somewhat more aggressive fiscally--the report more frequent use of such strategies as moving from local to state banks, persisting in putting bonds before voters until passage is secured, and refinancing debt to secure lower interest rates. The latter strategy may correlate with willingness to move from local to state banks.

Discussion

The emerging profile of K-12 unit schools, according to our data, shows a school in an agricultural region where SES is lower than the national average, with the school most frequently constituting a district unto itself. Enrollment is about 400 on average in such a school, which is comparatively remote from key resources and, notably, from the state capital (home of the SEA). Educational resources like universities and intermediate educational service agencies (e.g., BOCES or RESAs) are about an hour away, on average.

Though superintendents report above-average test scores, postsecondary attendance, and high school completion rates across the entire sample, superintendents of single-school districts are more positive than superintendents of multi-school districts. The differences may be an artifact of the differing roles of superintendent in single- and multi-school districts (with superintendents of single-school districts often being the principals of their schools).

Distance learning technologies are in use in these schools. Satellite and Internet systems are most prevalent; *both* systems are in use in two-fifths of these schools. Nearly one-fifth use satellite, Internet, and ITFS systems. Costs were perceived as the major barrier to the use of distance learning technologies across four categories of users (non-users to high-level users). For instance, among non-users, more than four-fifths reported startup costs to be a substantial barrier, but three-fifths of high-level users reported startup costs as a substantial barrier. No other sorts of barriers were regarded as so serious an impediment.

Our community attitude composite variable exhibited considerable variation and correlated moderately with reported SES. The variance in this measure, however, did not appear to be associated with single- or multi-school districts or with economic basis (agriculture versus

other). In a subsequent analysis (see Table 6), however, community attitudes were shown to be moderately and positively related, only in the case of single-school districts, to our sustainability measure for those schools (a count variable). The correlation with our sustainability measure for multi-district schools was not statistically significant.

Data reported to us seems to indicate that single-school districts confront very different fiscal circumstances as compared to multi-school districts, and that, not surprisingly they respond to those differing circumstances by using certain fiscal strategies more frequently. First, information reported about the single-school suggest these districts spend almost 50% more per pupil than multi-school districts (comparison based on median expenditures)

Because this difference in expenditures was *so striking*, we performed a one-way ANOVA on our school-level SES variable. In fact, the reported SES ratings were not statistically different for single- and multi-district schools. Although we did establish homogeneity of variance for the two groups, the range of expenditures for the single-district groups was much wider than for multi-school districts. Advantages that produce the observed expenditure disparities may be fortuitous rather than systematic.

Reported expenditures per pupil also differed by remoteness, but the middle-category of remoteness showed highest expenditures per pupil, largely because so many single-school districts came under this rubric. The difference in per pupil expenditures between the least and most remote schools was about \$150--almost negligible in view of likely differences in transportation costs.

For both single- and multi-school districts we constructed a sustainability measure intended to bear on fiscal issues and value of the school to its local community. There was a

strong correlation (negative) between remoteness and the multi-school sustainability measure. In the case of multi-school districts it seems clear that remote location per se ensures the existence of many K-12 schools. This is not the case for single-district schools, for which the association is not significant. With them, it seems more likely that some variety of community support or involvement is important to their persistence.

Finally, given the differences in fiscal circumstances between single- and multi-school districts, it would seem likely that fiscal practices differ. There is support for this hypothesis. Single-school districts seem more frequently than multi-school districts to employ cooperative strategies to maximize resources--joining regional service agencies, cooperating with other districts, for instance. As well, they seem less fiscally aggressive in that they are less likely to refinance debt, transfer funds from local to state institutions, or to pursue bond issues relentlessly. These less used practices may, in fact, indicate a degree of support for local institutions and a degree of support from local institutions to the schools.

Limitations

This first description of K-12 schooling in the United States is based on a survey of superintendents. On a lengthy protocol, respondents provided a great deal of information about many issues. Readers must bear this fact in mind. Findings, for instance, are indicative of community attitudes, but they are not based on a survey of community members in any of the responding districts.

With a universe of approximately 1,000 schools and 700 districts, sample sizes (205 for schools and 159 for districts) is not sufficient to ensure a high degree of generalizability to the

universe. Missing cases for certain sensitive data (expenditure per pupil in particular) make it even more difficult to ensure generalizability. Results are suggestive and intriguing, and they may help inform future work.

Recommendations

Several recommendations are possible for research and practice. The focus of practical recommendations concerns distance learning options.

The Federal Communications Commission is currently considering the sorts of services to be made available to schools and the manner of supporting purchase of such services. This research provides insight into three issues. First, costs for startup, maintenance, and improvement of distance learning efforts are perceived by rural superintendents as substantial barriers to their use. Second, schools need more than "plain old telephone services"--they need advanced services. Third, schools a combination of systems to meet their needs; one solution (e.g., Internet or Satellite or ITFS) should not be mandated as the only route into the 21st century. Rural schools, especially small, remote, and locally supported rural schools need the *flexibility* to fashion systems responsive to their peculiar needs.

Audioconferencing was not reported as widely used among this sample. Yet speaker phones and conferencing arrangements are widely accessible today with a modest investment in equipment and fees. For instance, Chance and Lobaugh (1995) reported examples and procedures for conducting "audio field trips." Other options might include classes in remote schools collaborating to carry out a joint study or create a joint work. In our sample of schools, however, audioconferencing seemed to be used in addition to rather than instead of more

complex and expensive systems.

Data gathered in this study but not reported in this paper include educational aims, staffing, special education, curriculum, extracurriculum, and uses served by distance learning technologies. Subsequent work based on this survey will examine these issues. Most important, we believe, are investigations that explore links between various circumstances of community and the sustainability of small rural schools. The data set produced from this survey contains variables that potentially reflect community responsiveness across all issues (those considered here and those awaiting analysis).

The distinction between K-12 unit schools in single-school districts and in multi-school districts would seem, on the basis of findings reported here, an interesting difference to pursue in much greater depth. Single-district schools seem to elicit greater support and perhaps involvement from their communities, a support that apparently is reflected in dollars. More work needs to be done to define the differences in the two sets of circumstances and to consider the relevant issues of local and organizational culture and opportunity. Are single-school districts more effective (as our data suggest)? What historical or other conditions account for their persistence? Are there lessons for school reform in the experiences of K-12 unit schools?

Table 1

Number of Districts and Schools for Which Data Are Reported, by State

State	Districts		Schools	
	N	%	N	%
Alaska	4	2.5	10	4.9
Alabama	7	4.4	17	8.3
California	1	.6	1	.5
Florida	4	2.5	5	2.4
Georgia	2	1.3	2	1.0
Hawaii	1	.6	3	1.5
Iowa	2	1.3	2	1.0
Idaho	4	2.5	4	2.0
Illionis	1	.6	1	.5
Indiana	2	1.3	2	1.0
Louisiana	7	4.4	15	7.3
Maryland	1	.6	3	1.5
Maine	3	1.9	3	1.5
Michigan	7	4.4	7	3.4
Mississippi	8	5.0	15	7.3
North Carolina	2	1.3	2	1.0
New York	25	15.7	25	12.2
Oregon	9	5.7	10	4.9
Pennsylvania	2	1.3	2	1.0
Rhode Island	1	.6	1	.5
Tennessee	12	7.5	17	8.3
Texas	36	22.6	36	17.6
Utah	2	1.3	2	1.0
Virginia	1	.6	1	.5
Vermont	2	1.3	3	1.5
Washington	13	8.2	14	6.8
West Virginia	1	1.3	2	1.0
Total	159	100.0%	205	100.0%

Table 2

Remoteness from Key Resources

Resource	Median Distance in Minutes from District Offices	Most Remote 15%
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hospital	20	50+
K-12 Unit school	30	50+
interstate exit	30	90+
votech center	45	90+
community college	45	75+
intermediate unit	60	90+
university or 4-yr college	60	110+
city of 50,000	60	115+
state capital	180	310+

Note. Distances to K-12 unit school(s) given for multi-school districts only, as we assume the district offices are located in or near the K-12 school in the case of single-school districts.

Table 3

Student Performance in K-12 Unit Schools

Performance	Ratings	Frequencies			
		Single-school Districts		Multi-school Districts	
		Valid %	N	Valid %	N
Test Scores	Below Average	10.6	11	21.5	20
	Average	33.0	34	41.9	39
	Above Average	56.4	58	36.5	34
Postsecond.	Below Average	14.7	15	24.5	21
	Average	23.5	24	38.4	33
	Above Average	61.7	63	37.2	32
Completion	Below Average	2.0	2	7.6	7
	Average	6.8	7	14.0	13
	Above Average	92.2	94	73.2	68

Note. On a five point scale, Below Average=rated "1" or "2"; Average=rated "3"; Above Average=rated "4" or "5."

Table 4

Distance Learning System Usage by Usage Level in K-12 Unit Schools

Technology Systems	Percentages		
	Low (n=45)	Moderate (n=63)	High (n=50)
Satellite	51	18	98
Internet	44	71	96
ITFS	2	29	92
Audioconf.	2	13	40
Audiograph.	0	5	14

Note. Missing cases (n=10); non-users (n=37 or 19% of valid cases). Usage level is based on a count of use of the five listed systems; low level of use = 1 of 5; moderate level of use = 2 of 5; high level of use = 3 or more of 5. This rubric divides the school sample approximately by thirds.

Table 5

Per Pupil Expenditures by Remoteness of Location (all K-12 unit schools)

	Expenditure/Pupil	Standard Deviation	N
least remote	\$5265	\$448	27
more remote	\$8305	\$780	46
most remote	\$5413	\$509	13

Note. Remoteness is a composite of 6 items measuring distance in minutes from a variety of salient resources (e.g., city of 50,000, state capital, university, vocational school, intermediate service agency) with an alpha reliability = .88; cases were divided into 3 groups of equal numbers representing low, middle, and high scores. Missing values on per pupil expenditure substantially reduce the number of cases available for analysis. Missing cases = 119.

Table 6

"Sustainability" of K-12 Unit Schools

Correlations (r) with "Sustainability"			

Multi-School Districts	Remoteness	Community Att.	Expenditures/Pupil
	-.74	-.06	-.47
	(n=25)	(n=43)	(n=37)
	(P<.001)	(n.s.)	(P<.01)
Single-School Districts	-.03	.35	.09
	(n=66)	(n=83)	(n=84)
	(n.s.)	(P<.05)	(n.s.)

Note. Multi-school district sustainability = sum of ratings (1-5) on importance of following as reason for persistence of K-12 schools: availability of additional funding, operating expenses same as for other schools in district, lack of external pressure to close (alpha=.87). Sustainability for single-school districts = sum of ratings (0=no, 1=yes) on previous attempts to close not successful, more than 50% revenues local, school very responsive to local needs, school unusually effective in comparison to state averages (count variable, alpha not computed).

Table 7

Ten Top-Ranked Fiscal Practices by Type of District

	Percentages	
	Single-School	Multi-School
join RESA or consortium	84	45 (4.5)
cooperation w/other districts	71	34 (7.5)
pay bills promptly	69	66 (2)
energy conservation	68	62 (3)
competitive bidding all purchases	65	75 (1)
pool efforts in insurance & investment programs	58	34 (7.5)
increase student count (ADA)	47	45 (4.5)
reduce use of substitute tchrs	38	26 (--)
maximize earnings (move from local to state bank)	30	42 (6)
use sweep accounts (e.g., daily deposits to investment account)	26	21 (--)
go for bond until passage	13 (--)	32 (9)
refinance debt to lower interest	11 (--)	30 (10)

Note. Numerals in parentheses in second column indicate ranks for practices reportedly used most frequently in multi-school districts. For single-school districts n=99; for multi-school districts n=47; missing cases=13. In general, for this sample, differences between the two columns of +/-20% within the range of these values are statistically significant at between $p < .05$ and $p < .01$.

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